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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,057	05/22/2006	Guofu Zhou	NL 031369	7596
24737 7590 03/17/2009 PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510				
EXAMINER KITEMA, BENYAM				
ART UNIT		PAPER NUMBER		
2629				
MAIL DATE		DELIVERY MODE		
03/17/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/580,057

Applicant(s)

ZHOU ET AL.

Examiner

BENYAM KETEMA

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 22 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

1. Claims 1-12 are presented for examination.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. EPO 03104353.2, filed on 11/25/2003.

Claim Objections

3. Claim 12 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claim in question is in reference to claim 12 "**drive means**" which is mentioned in claim 1. And claim 12 is dependent upon. Hence, it does not limit the subject matter of claim 1 it is dependent upon.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-5 and 10-12 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. PG Pub No. 2003/0137521A1 (Zehner et al.).

As in Claims 1, 11, Zehner et. al. discloses *display apparatus, method of driving a display apparatus*

- *an electrophoretic medium (Paragraph 2 line 1-14) comprising*
- *charged particles (6) in a fluid; (Paragraph 2 line 6-14)*
- *a plurality of picture elements (Paragraph 89 line 8-24); discloses pixels arranged in row and columns hence showing plurality of pixels (i.e. picture elements).*
- *a first and second electrode (3, 4) associated with each picture element (2) for receiving a potential difference, said charged particles being able to occupy a position being one of at least four positions, two of said positions being extreme positions substantially adjacent said electrodes and the remaining positions*

being intermediate positions between said electrodes (3, 4); (Paragraph 2, line 6-14) discloses charged particles are moved under the influence of electric field to plurality of positions to change the appearance of the display. And (Paragraph 167) discloses four positions of charged particles (i.e. two extreme position black & white, and two intermediate light gray & dark gray).

- *and drive means arranged to supply a sequence of picture potential differences to each of said picture elements (2) so as to cause said charged particles (6) to occupy one of said positions for displaying an image; wherein said sequence of picture potential differences form a driving waveform for (Paragraph 90, line 1-11)*
- *a) causing said charged particles (6) to move cyclically between said extreme positions in a single optical path and effect a desired optical transition along said optical path, if the desired optical transition is from a first intermediate position to a second intermediate position or between an intermediate position and the extreme position furthest therefrom, (Paragraph 163, line 1-10)*
- *and b) if the desired optical transition is from an intermediate position to the extreme position closest thereto, causing said charged particles to move substantially directly towards the extreme position via the shortest route and effect said optical transition. (Paragraph 161, line 3-8 and Fig 9)*

As in Claim 2, Zehner et al. discloses *display apparatus* (Fig 1 item 26) according to claim 1, wherein an optical transition from a first intermediate position to an extreme position closest thereto is effected substantially directly by means of a single voltage pulse (20). (Paragraph 161, line 3-8)

As in Claim 3, Zehner et al. discloses *display apparatus* (Fig 1 item 26) according to claim 1, wherein said single voltage pulse (20) is of substantially equal amplitude and duration, and of opposite polarity, to the picture potential difference required to effect an optical transition from said extreme position to said intermediate position. (Paragraph 85, line 1-18)

As in Claim 4, Zehner et al. discloses *display apparatus* (Fig 1 item 26) according to claim 1, wherein said driving waveform comprises pulse width modulated voltage pulses. (Paragraph 71, line 16-20)

As in Claim 5, Zehner et al. discloses *display apparatus* (Fig 1 item 26) according to claim 1, wherein said driving waveform comprises voltage modulated voltage pulses. (Paragraph 71, line 2-11)

As in Claim 10, Zehner et al. discloses *display apparatus* (Fig 1 item 26) according to claim 1, wherein said driving waveform is substantially dc-balanced. (Paragraph 196, line 1-13)

As in Claim 12, Zehner et al. discloses *drive means for driving a display apparatus* (Fig 1 item 26) *according to claim 1, said drive means being arranged to supply a sequence of picture potential differences to each of said picture elements (2) so as to cause said charged particles (6) to occupy one of said positions for displaying an image; wherein said sequence of picture potential differences form a driving waveform for* (Paragraph 90, line 1-11) *a) causing said charged particles (6) to move cyclically between said extreme positions in a single optical path and effect a desired optical transition along said optical path, if the desired optical transition is from a first intermediate position to a second intermediate position or between an intermediate position and the extreme position furthest therefrom* (Paragraph 163, line 1-10) *b) if the desired optical transition is from an intermediate position to the extreme position closest thereto, causing said charged particles (6) to move substantially directly towards the extreme position via the shortest route and effect said optical transition.* (Paragraph 161, line 3-8 and Fig 9)

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zehner et al. (U.S. PG Pub No. 2003/0137521A1) in view of Machida et al. (PG Pub 2002/0196207)

As in Claim 6, Zehner et al. discloses *display apparatus* (Fig 1 item 26) as discussed above, but fails to disclose *the drive waveforms are preceded by single shaking pulse*. However, Machida et al. (See Fig 9 item initializing drive pulses) discloses shaking pulses (initializing drive) are being applied in drive waveform. Zehner et al. and Machida et al. are analogous art because they are from the common area of electrophoretic display and represent known display alternatives. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references (Zehner et al. and Machida et al.) because Machida et al. suggests the application of shaking pulses effectively releases or loosen the particles from their current position so that they can be addressed by driving a pulse to the appropriate optical state to enhance the display quality. It also provides method for addressing a

bistable display element having first and second display states differing in at least one optical property. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display device of Zehner et al. by applying a shaking pulses as disclosed by Machida et al. because Machida et al. suggests the application of shaking pulses effectively releases or loosen the particles from their current position so that they can be addressed by driving a pulse to the appropriate optical state to enhance the display quality, as found in claim 6.

As in Claim 7, Zehner et al. discloses *display apparatus* (Fig 1 item 26) as discussed above, but fails to disclose *the drive waveforms are preceded by more than one shaking pulse* However, Machida et al. (See Fig 9 item initializing drive pulses) discloses a series of shaking pulses (initializing drive) are being applied in drive waveform. Machida et al. suggests the application of shaking pulses effectively releases or loosen the particles from their current position so that they can be addressed by driving a pulse to the appropriate optical state to enhance the display quality. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display device of Zehner et al. by applying a series shaking pulses as disclosed by Machida et al. because Machida et al. suggests the application of shaking pulses effectively releases or loosen the particles from their current position so that they can be addressed by driving a pulse to the appropriate optical state to enhance the display quality.

As in Claim 8, Zehner et al. discloses *display apparatus* (Fig 1 item 26) as discussed above, but fails to disclose *the polarity of the single shaking pulse is opposite to that of the first pulse of the subsequent drive waveform*. However, Machida et al. (See Fig 9) discloses a series of shaking pulses (initializing drive, +300v) that has opposite polarity of subsequent drive pulse. Machida et al. discloses the use of shaking pulses to solve the problem of particles being adhere to one side of the capsule. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention to modify the display device of Zehner et al. by apply shaking pulses that is opposite in polarity as to effectively release or loosen the particles from their current position so that they can be addressed to appropriate optical state.

As in Claim 9, Zehner et al. discloses *display apparatus* (Fig 1 item 26) as discussed above, but fails to disclose *the energy value (defined as the integration of voltage pulse with time) of a shaking pulse is sufficient to release the particles (6) at one of the extreme positions but insufficient to move the particles (6) from one of the extreme positions to the other*. However, Machida et al. (See Fig 9 item initializing pulse and Displaying white/black and Paragraph 25) discloses a series of shaking pulses (initializing drive), where one of this (single) pulse has shorter time period than that of the drive signal (Displaying white/black) that is applied to picture element in order to change optical state from one extreme state to another. Also a series of shaking pulses (initializing drive) that are used only to dissociate charged particles from adhesion to the substrates or adjacent particles so that it would be easy for drive pulse to move this

particles from one optical state to another. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made that shaking pulses are used to effectively release or loosen the particles from coagulation and not change optical state.

Prior Art

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent No US PG Pub No. 2002/0005832 discloses electrophoretic display, resetting period and writing period, an image data is supplied to a data line drive circuit and a gradation voltage is applied to each pixel electrode. Webber (US PG Pub No. 2002/0180687) discloses electrophoretic display comprises a plurality of particles suspended in a suspending fluid.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENYAM KETEMA whose telephone number is (571)270-7224. The examiner can normally be reached on Monday- Friday 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shalwala Bipin H can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

Art Unit: 2629

applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Benyam Ketema /

Examiner, Art Unit 2629

/Bipin Shalwala/

Supervisory Patent Examiner, Art Unit 2629